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10/671,359	09/25/2003	Charles Zdzislaw Lobo	614-L	7112
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UNISYS CORPORATION			EXAMINER	
Unisys Way			TIMBLIN, ROBERT M	
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Blue Bell, PA 19424			ART UNIT	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/671,359

**Applicant(s)**

LOBOZ ET AL.

**Examiner**

ROBERT TIMBLIN

**Art Unit**

2167

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 September 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 21, 23, 25 and 26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_\_ is/are rejected.
- 7) ☒ Claim(s) 22, 24, and 27 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SI/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

This Office Action corresponds to application 10/671,359 filed 9/25/2003.

#### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9/22/2008 has been entered.

#### ***Response to Amendment***

In the present Application, claims 21, 22, 23, 24, 25-27 have been amended and are pending.

#### ***Allowable Subject Matter***

Claims 22, 24, and 27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Accordingly, the specifics of these claims (e.g. the calculation of the critical read/write ratio including a second implementation compared to the first) appears to be distinguishing over the cited prior art. Therefore, claims 22, 24, and 27 contain allowable subject matter.

***Claim Objections***

Examiner thanks the Applicant for consideration and response to the previous claim objections. Accordingly, in light of the minor corrections and remarks, the claim objections have been withdrawn.

In light of further examination, the following new claim objections will be noted:

Claim 21 is objected to because, according to the indentation under (iii), it is unclear if step (iv) should be renumbered as step (iiic).

Claim 23 is objected to for the following:

Claim 23 is objected to because it recites a method operating in a computer system using a CPU, memory, I/O unit and database on disk, however, it is unclear how the method uses such components (i.e. there seems to be lacking execution of the components) to impart the recited tasks (i.e. "providing", "determining", "comparing"...). This claim is further objected to because "for modifying" should be "to modify" as to recite positive rather than intended recitations.

Claim 23 is also objected to because in step (d) it is unclear that when the average read/write ratio is greater than the critical ratio, that d1-d3 are performed. In other words, the determination is made, but the outcome of that determination is not clearly recited to be needed to perform the following functions. In particular "if" renders the following limitations unclear as being necessary to the claim.

Claim 23 is also objected to because step (d) recites "said the". Examiner submits that either word in this phrase should be deleted for clarity.

Claim 23 is also objected to because step (d) recites "invoking"; however what is actually invoked is unclear.

Claim 23 is also objected to because it appears in accordance with the other amended limitations of this claim, that the "means" in "storing means" (i.e. step (d2)) should be removed.

Claim 23 is also objected to because the period after "conceptual entity" in step (d3) should be a semicolon.

Claim 25 is objected to under 37 CFR 175(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. In particular claim 25 is in improper dependent form because the claim fails the Infringement Test. See MPEP § 608.01(n) III. Under the terms of the Infringement Test, the test for a proper dependent claim is that the dependent claim "shall not conceivably be infringed by anything which would not also infringe the basic claim."

Dependent claim 25 fails this test because it is conceivable that a computer program product such as CD-ROM containing a computer program, could infringe dependent claim 34 ("A computer program product...") without infringing base claim 21, which is "A method operative in a computer system..."). Until the computer program is installed in a computer and executed, the claimed computer program product does not

perform the method of claim 1, and so a CD-ROM containing a computer program could infringe dependent claim 25 without infringing base claim 21.

As such, claim 25 fails the infringement test and therefore is an improper dependent claim. Applicant is required to cancel the claim, or amend the claim to place the claim in proper dependent form, or rewrite the claim in independent form.

Claim 27 is objected to because it recites "the said" in the preamble. Examiner respectfully requests the removal of one of these words in the phrase for clarity.

Step (iid) of Claim 27 is objected to because there should be a semicolon (;) after the 2<sup>nd</sup> occurrence of "database" rather than a colon (:)

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 21, 23, 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carlson et al. ('Carlson' hereafter) U.S. Patent Application 2003/0217078 in view of Krychniak et al. ("Krychniak" hereafter) U.S. Patent 6,192,357.

With respect to claim 21, Carlson teaches A method operative in a computer system for improving the performance of a database by determining whether or not to alter the fields of the database, having entities which hold a set of data values, said database including at least one set of linked entities, wherein the at least one set of linked entities contains a plurality, of conceptual entities, each of the conceptual entities including a plurality of data values which are distributed amongst the plurality of the conceptual entities, comprising the steps of:

(i) determining an average read/write ratio (0010, 0032 and figure 4; e.g. average access time) of the plurality of data values (abs e.g. data storage and retrieval describes the accessing of data) distributed amongst the at least one set of linked entities in the database (0011);

(ii) comparing the average read/write ratio (0010, 0032 and figure 4; e.g. average access time) of the database (0011) to a predetermined critical read/write ratio (0010; e.g. threshold value); and

(iii) if the average read/write ratio (0010, 0032 and figure 4; e.g. average access time) is greater than (0010, exceeding the maximum access time and drawing reference 650) the critical read/write ratio (0010; e.g. threshold value), then performing the following method steps:

(iv) altering the fields of the database (drawing reference 660 and paragraph 0066) when said average read/write ratio (0010, 0032 and figure 4; e.g. average access time) is greater than (0010, exceeding the maximum access time and drawing reference 650) said critical read/write ratio (0010; e.g. threshold value).

Carlson does not appear to expressly teach "linked entities" in a database and further the steps of:

(iiia) defining an additional entity table in the database; and

(iiib) storing in the additional entity table an aggregation of said plurality of data values representing an aggregation of at least one of the plurality of conceptual entities, whereby the information defining the conceptual entity is obtained by performing a single read operation on the additional entity table.

Krychniak, however, teaches "linked entities" (e.g. figure 1 dimensions 1-3 with the fact table are "linked" to describe a relational database) in the database and further the steps of:

(iiia) defining an additional entity table in the database (fig. 1 fact table and figure 2C which are present and thus defined); and

(iiib) storing in the additional entity table (figure 1, fact table and fig. 2C) an aggregation of said plurality of data values (i.e. fact table contains the keys of the dimensional tables) representing an aggregation of at least one of the plurality of conceptual entities (dimensions 1-3, figure 1 and figures 2a-2c wherein figure 2C illustrates an aggregation of the table in 2a with the table in 2B), whereby the information defining the conceptual entity is obtained by performing a single read operation (co. 2 lines 11-28 discloses performing a read operation on the fact table; see also figure 4 wherein in certain situations, use of a join query is avoided) on the additional entity table (figure 1, fact table, 2C).



In the same field of endeavor, (i.e. access optimization), it would have been obvious to one of ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references because the teachings in Krychniak would have given Carlson additional optimized methods for rebuilding a [relational] database when it is determined that maintenance is required (e.g. Carlson, figures 6-7) through the determination that database performance is unacceptable (i.e. comparison of access time vs. a "critical" threshold – Carlson, 0010-0011). Such methods would have further provided Carlson with access optimization (e.g. the addition of Krychniak's fact table, aggregated table 2C) by providing a quick access aggregated table of data values for efficient data accessing when performance is sub par.

With respect to claim 23, Carlson teaches A method operating in a computer system using a C.P.U, memory I/O unit and database on disk for modifying a database by determining whether or not to alter the fields of the database having entities which hold a set of data values, comprising:

b) determining an average read/write ratio (0010, 0032 and figure 4; e.g. average access time) of the plurality of data values (abs e.g. data storage and retrieval describes the accessing of data) distributed amongst the at least one set of linked entities in the database (0011);

(c) comparing the average read/write ratio (0010, 0032 and figure 4; e.g. average access time) of the database (0011) to a predetermined critical read/write ratio (0010; e.g. threshold value); and

(d) determining, if the average read/write ratio (0010, 0032 and figure 4; e.g. average access time) is greater than (0010, exceeding the maximum access time and drawing reference 650) said the critical read/write ratio (0010; e.g. threshold value), to invoke;

(e) modifying the fields of the database (drawing reference 660 and paragraph 0066) when said average read/write ratio exceeds (0010, exceeding the maximum access time and drawing reference 650) said critical read/write ratio (0010; e.g. threshold value).

Carlson does not appear to expressly teach "linked entities" in a database and further the steps of:

(a) providing at least one set of linked entities in the said database, wherein the said at least one set of linked entities contains a plurality of conceptual entities, each of the conceptual entities including a plurality of data values which are distributed amongst the plurality of conceptual entities;

(d1) defining an additional entity table in addition to the at least one set of linked entities;

(d2) storing means, in said additional entity table, the aggregation of said plurality of data values representing an aggregation of at least one said plurality of conceptual entities; and

(d3) reading said aggregation of said plurality of data values by performing a single read operation on said additional entity table to return the information determining at least one conceptual entity.

Krychniak, however, teaches "linked entities" (e.g. figure 1 dimensions 1-3 with the fact table are "linked" to describe a relational database) in the database and further the steps of:

(a) providing at least one set of linked entities (figure 1, dimensions and col. 1 line 26) in the said database (drawing reference 6), wherein the said at least one set of linked entities (dimensions) contains a plurality of conceptual entities (dimensions 1-3, figure 1 and figures 2a-2c), each of the conceptual entities (dimensions) including a plurality of data values (figure 1, attributes and keys) which are distributed amongst (abstract) the plurality of conceptual entities (dimensional);

(d1) defining an additional entity table (figure 1, fact table) in addition to the at least one set of linked entities (dimensions);;

(d2) storing means, in said additional entity table (figure 1, fact table), the aggregation of said plurality of data values (i.e. fact table contains the keys of the dimensional table) representing an aggregation of at least one said plurality of conceptual entities (dimensions 1-3, figure 1 and figures 2a-2c); and

(d3) reading said aggregation of said plurality of data values by performing a single read operation (co. 2 lines 11-28 discloses performing a read operation on the fact table; see also figure 4 wherein in certain situations, use of a join query is avoided) on said additional entity table (fact table) to return the information determining at least one conceptual entity (col. 2 line 9-10).

In the same field of endeavor, (i.e. access optimization), it would have been obvious to one of ordinary skill in the data processing art at the time of the present invention to

combine the teachings of the cited references because the teachings in Krychniak would have given Carlson additional optimized methods for rebuilding a [relational] database when it is determined that maintenance is required (e.g. Carlson, figures 6-7) through the determination that database performance is unacceptable (i.e. comparison of access time vs. a "critical" threshold – Carlson, 0010-0011). Such methods would have further provided Carlson with access optimization (e.g. the addition of Krychniak's fact table, aggregated table 2C) by providing a quick access aggregated table of data values for efficient data accessing when performance is sub par.

With respect to claim 25, this claim incorporates the limitations found in claim 21 and therefore is rejected for the same reasons.

With respect to claim 26, Carlson teaches An electronic machine holding a computer, memory means, and electronic database which utilizes a computer program for improving the performance of said database including at least one set of linked entities, wherein the at least one set of linked entities contains a plurality of conceptual entities, each of the conceptual entities including a plurality of data values which, are distributed amongst the plurality of the conceptual entities, said computer program including at least one instruction which, when executed by a computer sys-tem, is arranged to carry out the following steps:

(i) determining an average read/write ratio (0010, 0032 and figure 4; e.g. average access time) of the plurality of data values (abs e.g. data storage and retrieval describes

the accessing of data) distributed amongst the at least one set of linked entities in the database (0011);

(ii) comparing the average read/write ratio (0010, 0032 and figure 4; e.g. average access time) of the database (0011) to a predetermined critical read/write ratio (0010; e.g. threshold value); and

(iii) if the average read/write ratio (0010, 0032 and figure 4; e.g. average access time) is greater than (0010, exceeding the maximum access time and drawing reference 650) the critical read/write ratio (0010; e.g. threshold value), then performing the following method steps:

(iv) altering the fields of the database (drawing reference 660 and paragraph 0066) when said average read/write ratio (0010, 0032 and figure 4; e.g. average access time) is greater than (0010, exceeding the maximum access time and drawing reference 650) said critical read/write ratio (0010; e.g. threshold value).

Carlson does not appear to expressly teach "linked entities" in a database and further the steps of:

(iiia) defining an additional entity table in the database; and

(iiib) storing in the additional entity table an aggregation of said plurality of data values representing an aggregation of at least one of the plurality of conceptual entities, whereby the information defining the conceptual entity is obtained by performing a single read operation on the additional entity table.

Krychniak, however, teaches "linked entities" (e.g. figure 1 dimensions 1-3 with the fact table are "linked" to describe a relational database) in the database and further the steps of:

(iiia) defining an additional entity table in the database (fig. 1 fact table and figure 2C which are present and thus defined); and

(iiib) storing in the additional entity table (figure 1, fact table and fig. 2C) an aggregation of said plurality of data values (i.e. fact table contains the keys of the dimensional tables) representing an aggregation of at least one of the plurality of conceptual entities (dimensions 1-3, figure 1 and figures 2a-2c wherein figure 2C illustrates an aggregation of the table in 2a with the table in 2B), whereby the information defining the conceptual entity is obtained by performing a single read operation (co. 2 lines 11-28 discloses performing a read operation on the fact table; see also figure 4 wherein in certain situations, use of a join query is avoided) on the additional entity table (figure 1, fact table, 2C).

In the same field of endeavor, (i.e. access optimization), it would have been obvious to one of ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references because the teachings in Krychniak would have given Carlson additional optimized methods for rebuilding a [relational] database when it is determined that maintenance is required (e.g. Carlson, figures 6-7) through the determination that database performance is unacceptable (i.e. comparison of access time vs. a "critical" threshold – Carlson, 0010-0011). Such methods would have further provided Carlson with access optimization (e.g. the addition of Krychniak's

fact table, aggregated table 2C) by providing a quick access aggregated table of data values for efficient data accessing when performance is sub par.

### ***Response to Arguments***

Applicant's arguments submitted 9/22/2008 with respect to the pending claims have been considered but are moot in view of the new ground(s) of rejection.

Examiner submits the argument of combining the three references (Krychniak, Prabhakaran, and Tenorio has been persuasive. Examiner submits that there may be insufficient motivation to combine these references. However, in light of a new grounds of rejection, the combination of Carlson and Krychniak (see above) appear to have motivation to combine as well as providing teachings of the current application. Accordingly, arguments thereto are rendered moot in view of these new grounds of rejection.

Examiner further submits that Krychniak disclose the claimed additional entity as at least a fact table and also in figure 2C (which discloses the aggregation of data from tables 2A-B).

Examiner also remarks that claims 22, 24, 27 have been objected to as they seem to contain distinct subject matter and would appear to be allowable if rewritten in independent form.

***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert M. Timblin whose telephone number is 571-272-5627. The examiner can normally be reached on M-Th 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Cottingham can be reached on 571-272-7079. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ROBERT TIMBLIN/  
Examiner, Art Unit 2167

/John R. Cottingham/

Supervisory Patent Examiner, Art Unit 2167